

SELF-CAPACITIVE TOUCH DISPLAY PANEL AND DISPLAY DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit and priority of Chinese Patent Application No. 201510614243.9 filed Sep. 23, 2015. The entire disclosure of the above application is incorporated herein by reference.

FIELD

[0002] The present disclosure relates to the field of display technologies, and more particularly, to a self-capacitive touch display panel and a display device.

BACKGROUND

[0003] This section provides background information related to the present disclosure which is not necessarily prior art.

[0004] At present, an embedded touch technology becomes more and more popular with panel manufacturers because it may be compatible with a display panel technology. An existing embedded touch screen implements touch position detection by using a mutual-capacitance or self-capacitance technology. When the self-capacitance technology is used, a plurality of mutually insulated self-capacitance electrodes are disposed on the same layer of the touch screen. When a human body does not touch the screen, capacitance values of the self-capacitance electrodes are preset values. When the human body touches the screen, the capacitance values of the touched self-capacitance electrodes are changed. During the touch phase, a touch detection circuit may determine touch position by detecting the changes of the capacitance values of the self-capacitance electrodes.

[0005] In addition, an organic electroluminescent display (OLED) is one of focuses in the research field of existing flat panel displays. Compared with a liquid crystal display (LCD), the OLED has advantageous performance of low power consumption, high color saturation, wide viewing angle, thin thickness, fast response speed and realizable flexibility, etc. At present, in the fields of mobile phones, tablet computers and digital cameras or the like, the OLED begins to replace the traditional LCD.

[0006] How to integrate the embedded self-capacitive touch technology with the organic electroluminescent technology to form a new-type OLED having touch function is a technical problem to be urgently solved by persons skilled in the art.

SUMMARY

[0007] This section provides a general summary of the disclosure, and is not a comprehensive disclosure of its full scope or all of its features.

[0008] The self-capacitive touch display panel and the display device provided by embodiments of the present disclosure not only reduce the thickness of the touch display panel, but also guarantee a whole layer cathode structure of a display component and effectively guarantee the display quality of the original product.

[0009] According to a first aspect of the present disclosure, a self-capacitive touch display panel is provided, comprising: a substrate and a plurality of top-emitting type

organic electroluminescent structures, which are disposed on the substrate and share one cathode. The self-capacitive touch display panel further comprising: a plurality of self-capacitive touch electrodes, which are disposed at the same layer, positioned above the cathode and insulated with the cathode; a plurality of touch leads, which are electrically connected with the plurality of self-capacitive touch electrodes; and a touch detection circuit, which is configured to determine a touch position by detecting the change of the capacitance values of the self-capacitive touch electrodes during a touch phase. The self-capacitive touch electrodes are connected with the touch detection circuit by way of the respective touch leads.

[0010] In the embodiments of the present disclosure, the cathode and an anode of the top-emitting type organic electroluminescent structure are inputted with a signal which is identical to a drive signal of the self-capacitive touch electrode, during the touch phase.

[0011] In the embodiments of the present disclosure, the top-emitting type organic electroluminescent structure is configured to display black image during the touch phase.

[0012] In the embodiments of the present disclosure, the self-capacitive touch display panel further comprising a resin insulating layer disposed between the cathode and the self-capacitive touch electrodes.

[0013] In the embodiments of the present disclosure, the top-emitting type organic electroluminescent structure is configured to display an image during the touch phase.

[0014] In the embodiments of the present disclosure, the self-capacitive touch electrode is made of a transparent conducting material.

[0015] In the embodiments of the present disclosure, the self-capacitive touch electrode is made of one or more of ITO, IZO, TO, TAO, IO, CdO or graphene.

[0016] In the embodiments of the present disclosure, the touch leads and the self-capacitive touch electrodes are positioned at the same layer and are made of the same material.

[0017] According to a second aspect of the present disclosure, the embodiments of the present disclosure further provide a display device comprising the above mentioned self-capacitive touch display panel provided by the embodiments of the present disclosure.

[0018] By adding the self-capacitive touch electrodes above the top-emitting type organic electroluminescent structures, the above mentioned touch display panel and the display device provided by the embodiments of the present disclosure integrate the embedded self-capacitive touch technology with the organic electroluminescent technology, the touch display panel and the display device not only reduce the thickness of the touch display panel, but also guarantee a whole layer cathode structure of the top-emitting type organic electroluminescent structures and effectively guarantee the display quality of the original product.

[0019] Further aspects and areas of applicability will become apparent from the description provided herein. It should be understood that various aspects of this disclosure may be implemented individually or in combination with one or more other aspects. It should also be understood that the description and specific examples herein are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.